Primary Swenson's pull-through in children with chronic constipation: A preliminary report

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ABSTRACT

Background: The discrepancy in diameters of the resected ends coupled with the heavy faecal loads in the colon of chronically constipated children with Hirschsprung's disease makes definitive primary pull-through procedure quite difficulty in this group. **Patients and Methods:** Four consecutive patients (aged 5 months to 11 years) who presented with chronic constipation were given warm saline enema along with Castor oil per oram twice daily for 1 week before and 2 weeks after full-thickness biopsies that confirmed Hirschsprung's disease. All patients had intravenous Cefuroxime or Ceftriaxone plus Metronidazole at induction of anaesthesia. Intra-operatively, the levels of resections were 6–8 cm proximal to the most contractile part of the colon adjacent to the transition zone observed after complete division of mesenteric vessels. **Results:** There were three males and one female, aged 5 months to 11 years. The levels of aganglionosis were in the rectosigmoid region, except one in the descending colon. There was one case each of anastomotic stenoses, mild enterocolitis and deep peri-anal excoriation. The bowel motions were two to four times daily within 1 month post-operatively. **Conclusion:** It can be concluded from this preliminary study that with pre-operative saline enema and oral Castor oil for about 3 weeks in chronically constipated children with Hirschsprung's disease primary pull-through procedures can be performed successfully. However, further prospective work is required with this method.

Key words: Chronic constipation, Hirschsprung's disease, saline enema, Swenson's pull-through

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INTRODUCTION

Primary pull-through procedure, Soave's, Duhamel's or Swenson's procedure, has become the mainstay of treatment in children with Hirschsprung's disease following the first reported successful primary pull-through by So *et al.*,[1] which was followed by similar reports by many other workers.[2–9] However, most of the reports were on neonates and a few on the experience with infants and older children. The large calibre of the ganglionated colon in children with Hirschsprung's disease presenting with chronic constipation presents great challenges for primary anastomosis, but we opined that with gradual decompression of the colon, acceptable diameters for primary pull-through could be achieved. Furthermore, we also hypothesised that lack of facilities for intra-operative frozen section should not be an obstacle against the primary pull-through procedure. This prospective study in children aged 5 months to 11 years was performed to prove these two hypotheses.

MATERIALS AND METHODS

This study was carried out at the Surgery Departments of two Federal Medical Centres, Gombe and Owo, in the Gombe and Ondo state, respectively, Nigeria. Four consecutive patients presenting with chronic constipation, failure to thrive and tight anus were recruited into the study.

All patients had pre-operative warm isotonic saline enema twice daily along with Castor oil 2.5–10 ml twice daily per oram for a period of 5–7 days. A full-thickness rectal biopsy was performed at more than 4 cm from the dentate line, except in the first patient, within the first week on admission. During this period, the patients were allowed to take a normal diet and one patient was treated for bronchopneumonia. While awaiting the result of rectal biopsy, the combination of warm isotonic saline enema and per oram Castor oil was continued for a further 10–14 days and normal diet was discontinued 72 h before the definitive pull-through procedure.

Intra-operatively, the level of resection is determined

using pre-operative contrast radiographs, transition zone and, more importantly, the level of best colonic contraction following stimulation with a hot abdominal pack after division of the mesenteric vessels. The colon is marked at 6–8 cm proximal to this point for subsequent extra-peritoneal division and primary Swenson's coloanal anastomosis. Improvised rectal tube using 2–20-cc syringes is left in situ for a maximum of 1 week.

The age of the patients at presentation, body weight on admission, level of bowel aganglionosis, complications, duration of commencement of oral intake post-operative and duration of hospital stay were collated and analysed.

RESULTS

There were three males and one female, aged 5 months to 11 years. The female was the oldest. The mean weight on admission is 7.87 kg. All the patients had Barium enema pre-operatively and full-thickness rectal biopsies, which confirmed Hirschsprung's disease. A hockey stick incision was used to access the abdominal cavity in all patients [Figure 1]. The levels of aganglionosis were in the rectosigmoid region, except one in the descending colon, and post-operative histopathology reports confirmed adequate resection margins in all the patients. Oral intake was commenced in all the patients within the 72-h-post-operative period and bowel motion of 2–4 times per day was established within the first month in all. The post-operative complications include anastomotic stenoses, mild enterocolitis and severe peri-anal excoriation in one patient each.



Figure 1: Picture showing the hockey stick incision scar used in accessing the abdominal cavity

DISCUSSION

Primary pull-through procedures obviate the morbidity and mortality associated with the traditional staged procedures as have been demonstrated by several studies that compared the two approaches.[10–12] In resource-scarce environments and where there is aversion to the use of colostomy, the clinical significance of primary pull-through procedures cannot be over-emphasized.

It is apparent from this study that primary pull-through procedures can be safely carried out in chronically constipated children with Hirschsprung disease. The outcome of the primary anastomosis in this series with normal bowel motions within the first week of the procedures in all the patients showed that the criteria set out to determine the level of resection in this series could be used safely, especially in centres that lack facilities for frozen sections. Furthermore, gradual decompression of the grossly dilated proximal segment in Hirschsprung's disease, the major hindrance to primary anastomosis, can be easily overcome with warm saline enema and oral Castor oil, as evidenced in this study.

The envisaged technical difficulty of anastomosing a grossly dilated colon to a narrow anus is the main impediment against the primary pull-through procedure in older children presenting with chronic constipation. The evacuation of the colonic content with twice daily warm isotonic saline enema led to gradual reduction in the radius and wall tension (Laplace's law); hence, improving blood supply and return of muscle tone. Castor oil was given as a purgative because the obstruction in Hirschsprung's disease is functional and not mechanical. It has perhaps worked synergistically in emptying the bowel. However, there was no reported case of diarrhoea or abdominal colic during the period of usage.

The widest diameters of the proximal colonic segments ranged between 10 and 16 cm (average, 12 cm) on pre-operative contrast enema films with a reduction of within 40% after about 3 weeks of gradual decompression, as shown in the X-ray films before [Figure 2] and after a 20-day commencement of warm saline enema [Figure 3] in one of the patients. Because the usual

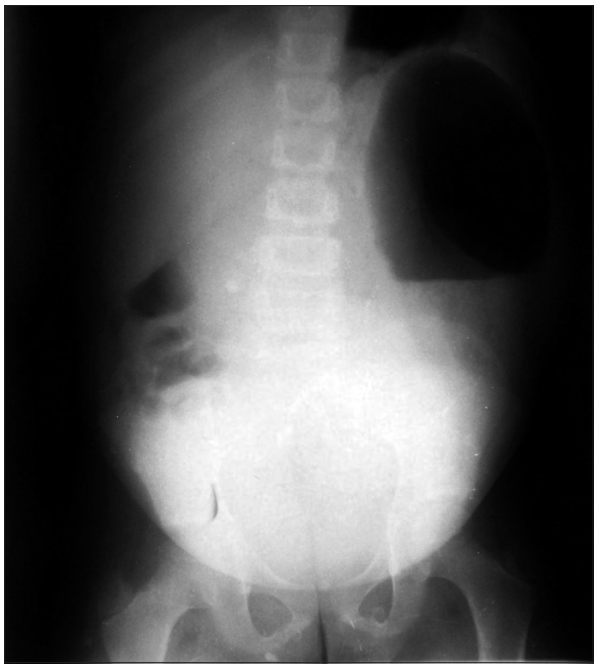


Figure 2: Plain abdominal x-ray in one of patients before the commencement warm saline enema

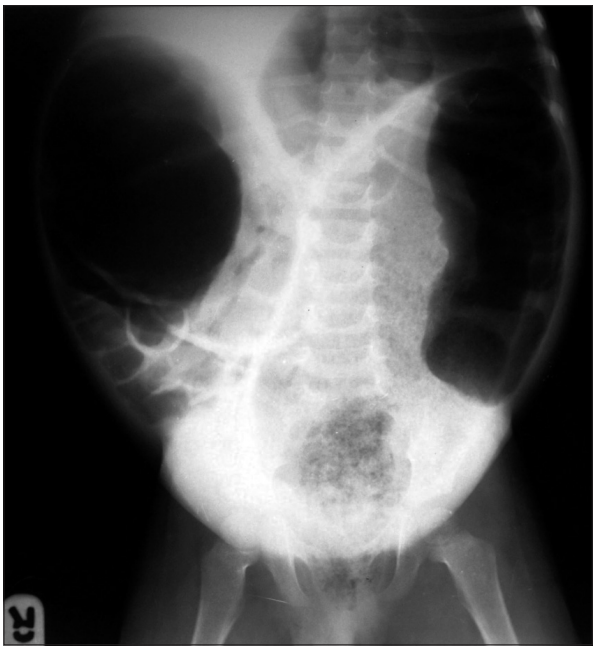


Figure 3: Pre-pull through plain abdominal x-ray in the same patient in figure 2. after 21 days warm saline enema

radiologic magnification ratio is 1:1, these were assumed to be the pre-operative colonic diameters. However, the observed intra-operative diameters were estimated to be 4.5–8.0 cm (average, 5.9 cm) and 50–55% of the diameters on the pre-operative contrast films.

Except in our first patient, full-thickness rectal biopsy was performed at more than 4 cm from the dentate line. In our first patient where the conventional 2–3 cm landmark was used, the site of the biopsy wound broke down, button-holed by the dissecting finger, creating some difficulty in achieving adequate distal dissection and mobilisation of the posterior aspect of the rectum.

Intra-operatively, the pre-operative Barium enema radiological transitory zones, which have been shown to correlate well with the pathological level of aganglionosis, especially in rectosigmoid disease,[13–14] were observed and resection was done away from these zones. We also observed that the colonic response to application of a hot abdominal pack was more marked and better appreciated after mobilisation and division of the inferior mesenteric vessels close to their origins. This could probably be due to severance of the extrinsic innervations whose fibres run with the inferior mesenteric vessels with consequently more pronounced intrinsic nerve activity. A distance of 6–8 cm proximal to this point of pronounced contraction was chosen for resection in order to ascertain that complete resection of the aganglionated part of the colon is achieved in the absence of frozen sections. There was no case of anastomotic breakdown.

Anastomotic stenosis occurred in our first patient who had diagnostic biopsy specimen taken at the classical 2–3 cm point from the dentate line as stated above. This is what informed our decision on subsequent biopsies been taken at more than 4 cm from the dentate line. This patient however responded well to digital dilatation by the mother within 2 weeks.

Deep peri-anal excoriation occurred in the 11-year-old female patient who had a 20-cc syringe used as improvised rectal tube. A tube of this size was used to commensurate the large size of the neorectum in this patient, but she did not tolerate it well. The excoriated area healed within a week of removal of the tube.

The third patient had what we believed was a mild enterocolitis. His bowel motion was persistently watery for about 3 weeks post-operatively but the condition did not necessitate re-admission and the stool became normal in consistency within the fourth week.

The total period of hospitalisation from admission to discharge was 30–35 days (average, 32.8 days), while the pre-biopsy period was 5–7 days [Table 1]. An average period of hospitalisation of 32.8 days was quite acceptable to our patients, probably because of the aversion to colostomy in our environment. However, we believe that this period of hospitalisation can be reduced and we intend to attempt this in our subsequent cases.

Table 1: Showing the biodata of the chronically constipated patients with Hirschsprung's disease

Age	Sex	Weight	Pre-Biopsy	Biopsy to pull through	Post pull through	Total period of stay	Level of aganglionosis
5 mo	M	5.6kg	5	10	15	30	Rectosigmoid
1 yr	M	8.5kg	7	13	13	33	Rectosigmoid
2 ½ yr	M	10.0kg	7	14	14	35	Rectosigmoid
11yr	F	*NR	7	10	13	30	Descending Colon

Numerical figures indicate the number of days, Average total period of hospitalisation is 32. 8 days, *NR: Not Recorded.

CONCLUSION

From this preliminary study, it can be concluded that with pre-operative warm saline enema and oral Castor oil for about 3 weeks in chronically constipated children with Hirschsprung's disease, irrespective of the age, primary pull-through procedures can be performed successfully and that this procedure can be carried out safely in centres that lack facilities for frozen section. However, further prospective work is required with this method.

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